

Proposal # 2001-

A207

(Office Use Only)

**PSP Cover Sheet** (Attach to the front of each proposal)

Proposal Title: Real-Time Flow Monitoring  
 Applicant Name: California Department of Water Resources  
 Contact Name: John Clements  
 Mailing Address: 2440 Main Street, Red Bluff, California 96080  
 Telephone: (530) 529-7369  
 Fax: (530) 529-7322  
 Email: clements@water.ca.gov

**Amount of funding requested:** \$ 711,200

Some entities charge different costs dependent on the source of the funds. If it is different for state or federal funds list below.

State cost \$733,000Federal cost \$711,200**Cost share partners?**x Yes      No

Identify partners and amount contributed by each Department of Water Resources \$476,000;  
U.S. Geological Survey \$262,000; Pacific Gas & Electric. \$46,000

**Indicate the Topic for which you are applying (check only one box).**

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> Natural Flow Regimes     | <input type="checkbox"/> Beyond the Riparian Corridor                |
| <input type="checkbox"/> Nonnative Invasive Species          | <input type="checkbox"/> Local Watershed Stewardship                 |
| <input type="checkbox"/> Channel Dynamics/Sediment Transport | <input type="checkbox"/> Environmental Education                     |
| <input type="checkbox"/> Flood Management                    | <input type="checkbox"/> Special Status Species Surveys and Studies  |
| <input type="checkbox"/> Shallow Water Tidal/ Marsh Habitat  | <input type="checkbox"/> Fishery Monitoring, Assessment and Research |
| <input type="checkbox"/> Contaminants                        | <input type="checkbox"/> Fish Screens                                |

What county or counties is the project located in? Tehama, Butte, Colusa, Sutter

**What CALFED eozone is the project located in? See attached list and indicate number. Be as specific as possible** Butte Basin (7) and Feather River and Sutter Bypass (8)

Indicate the type of applicant (check only one box):

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> State agency         | <input type="checkbox"/> Federal agency |
| <input type="checkbox"/> Public/Non-profit joint venture | <input type="checkbox"/> Non-profit     |
| <input type="checkbox"/> Local government/district       | <input type="checkbox"/> Tribes         |
| <input type="checkbox"/> University                      | <input type="checkbox"/> Private party  |
| <input type="checkbox"/> Other: _____                    |   |

**Indicate the primary species which the proposal addresses (check all that apply):**

- |  |   |
|--|---|
| <input type="checkbox"/> San Joaquin and East-side Delta tributaries fall-run chinook salmon | <input type="checkbox"/> Spring-run chinook salmon          |
| <input checked="" type="checkbox"/> Winter-run chinook salmon                                | <input checked="" type="checkbox"/> Fall-run chinook salmon |
| <input checked="" type="checkbox"/> Late-fall run chinook salmon                             | <input type="checkbox"/> Longfin smelt                      |
| <input type="checkbox"/> Delta smelt   | <input checked="" type="checkbox"/> Steelhead trout         |
| <input checked="" type="checkbox"/> Splittail  | <input type="checkbox"/> Striped bass                       |
| <input type="checkbox"/> Green sturgeon  | <input type="checkbox"/> All chinook species                |
| <input type="checkbox"/> White Sturgeon  | <input type="checkbox"/> All anadromous salmonids           |
| <input type="checkbox"/> Waterfowl and Shorebirds  | <input type="checkbox"/> American shad                      |
| <input type="checkbox"/> Migratory birds   |   |
| <input type="checkbox"/> Other listed T/E species: _____                                     |   |

**Indicate the type of project (check only one box):**

- |   |   |
|---|---|
| <input type="checkbox"/> Research/Monitoring                  | <input type="checkbox"/> Watershed Planning |
| <input type="checkbox"/> Pilot/Demo Project                   | <input type="checkbox"/> Education          |
| <input checked="" type="checkbox"/> Full-scale Implementation |   |

Is this a next-phase of an ongoing project? Yes X No \_\_\_\_\_  
Have you received funding from CALFED before? Yes \_\_\_\_\_ No X

If yes, list project title and CALFED number \_\_\_\_\_

Have you received funding from CVPIA before? Yes X No \_\_\_\_\_

If yes, list CVPIA program providing funding, project title and CVPIA number (if applicable):

See Below

**By signing below, the applicant declares the following:**

- The truthfulness of all representations in their proposal;
- The individual signing the form is entitled to submit the application on behalf of the applicant (if the applicant is an entity or organization); and
- The person submitting the application has read and understood the conflict of interest and confidentiality discussion in the PSP (Section 2.4) and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant, to the extent as provided in the Section.

John Clements  
Printed name of applicant

John Clements  
Signature of applicant

**PRIOR CVPIA AFRP GRANTS TO DEPARTMENT OF WATER RESOURCES NORTHERN DISTRICT FOR REAL-TIME MONITORING**

- 1) FY 1996: "Real-time flow monitoring and feed-back systems for Deer, Mill, Big Chico, and Butte Creeks", Document Control Number 11332-6-0186. In FY 1997, this grant was extended to include two monitoring sites on Antelope Creek. Total AFRP funding was \$391,500.
- 2) FY 2000: "Maintain real-time flow monitors on Antelope, Deer, Mill, Big Chico, and Butte Creeks", Document Control Number 11332-0-5011. Total AFRP funding was \$122,500.

## **B. Executive Summary**

**Title of Project:** Real-Time Flow Monitoring

**Requested Amount:** \$711,200

**Applicant:** California Department of Water Resources

John Clements, Senior Water Resources Engineer

2440 North Main Street

Red Bluff, CA 96080

Phone: (530) 529-7369; FAX: (530) 529-7322

Email: [clements@water.ca.gov](mailto:clements@water.ca.gov)

**Project Summary** - This project funds the continued operation and maintenance of flow monitoring stations that are part of an effort to assess, acquire, and manage minimum base instream flows in five eastside Sacramento River tributaries. Each of the five tributaries (Antelope, Mill, Deer, Big Chico, and Butte creeks) support at-risk species (including spring-run salmon and steelhead) and each has significantly impaired flows that have been detrimental to the survival of the at-risk species. Flows in each of the five tributaries have been significantly altered and recent restoration plans have identified the need to provide adequate base flows dedicated for instream use. Analysis of flows and diversions shows that the exercise of legal water rights (appropriative, adjudicated, and riparian) often exceeds instream flows critical for spring-run salmon and steelhead migration. Several recent water acquisition projects have been implemented including pumped groundwater exchanges on Mill and Deer creeks, a water exchange and water right purchase on Butte Creek, and a diversion removal on Big Chico Creek. Each of the acquisitions has provided some proportion of a minimum base flow. Additional efforts to determine appropriate instream flows are currently in progress and will require a long-term record of the daily hydrograph for the various reaches of each tributary. This project specifically addresses CALFED Ecosystem Restoration Strategic Goal #1 - At Risk Species, and secondarily Goal #4 - Habitats. It also addresses the Central Valley Project Improvement Act (CVPIA) priority focus on actions for recovery of Sacramento River spring-run chinook salmon and steelhead.

**Approach** - Base flows that are within the range of the minimum flow range of the natural hydrograph are essential to the restoration and future survival of these spring-run chinook salmon and steelhead populations. Flow monitoring stations have historically been operated on each of the tributaries by water management agencies. However, these data are generally inadequate for determination or management of minimum base flows. Installation and operation of flow monitoring stations specifically targeted for the management of anadromous fish migration will provide the necessary long-term time series data for determination of minimum base flows. Installation and operation of flow monitoring stations specifically targeted for the management of anadromous fish migration will ensure the presence of, and facilitate the management of, dedicated instream flows acquired for anadromous fish.

**Location** - Project sites are located on Antelope, Mill, Deer, Big Chico, and Butte creeks encompassing the Butte Basin, and Feather River and Sutter Basin Ecological Management Zones.

**Hypothesis** - Installation and long-term operation of flow monitoring stations, including sensors for temperature and turbidity, will significantly contribute to the recovery and long-term survival of spring-run chinook salmon and steelhead in Antelope, Mill, Deer, Big Chico, and Butte creeks.

**Uncertainties** - It is without question that anadromous fish require minimum instream flows for migration and rearing. However, due to the multitude of lethal and sub-lethal stressors in the migratory pathway, it is impossible to accurately predict the incremental benefit of eliminating a single stressor such as inadequate instream flows.

**Expected Outcome** - Minimum base flows dedicated for instream use will significantly contribute to the recovery of spring-run chinook salmon and steelhead in Antelope, Mill, Deer, Big Chico, and Butte creeks.

## C. Project Description

### 1. Statement of the Problem

**a. Problem** - Flows in five east-side tributaries to the Sacramento River that support sustaining or sporadic populations of spring-run chinook salmon and steelhead are inadequate during key adult and juvenile migration periods (Hallock, R., and W. Van Woert. 1959; Alley, D.W., and Associates, 1996; CDFG, 1998; CH2M Hill, 1998). Various flow acquisition projects have been, or are being implemented to provide minimum base flows (CDFG, 1994a, 1994b; M&T Ranch, 1996). Flow monitoring stations have been operated on each of the tributaries by water resource agencies. However, the historic record is insufficient to effectively analyze flow-related impacts to fish migration (CH2M Hill, 1998). Additionally, the current physical gage placement and management objective of the responsible water resource agencies does not effectively monitor minimum base flows acquired for instream use for fish (CH2M Hill, 1998).

Spring run chinook salmon once inhabited most of the east-side tributaries of the Sacramento-San Joaquin Valley and may have numbered 600,000 adults (CDFG, 1998). Access to much of the original holding and spawning habitat has been permanently eliminated, initially by early hydropower and agricultural diversion dams, and later by the major water supply and flood control dams. Within the last decade, wild persistent spring-run adult populations have declined to less than 1,300 fish, approximately 0.3% of their historic run sizes. Only three small east-side tributaries to the Sacramento River (Mill, Deer, and Butte creeks) continue to harbor wild persistent populations, while two others (Antelope and Big Chico creeks) support sporadic populations. Additionally, Mill, Deer, and Antelope creeks each harbor small sustaining population of steelhead, and are considered to have the greatest potential for restoration of steelhead in the entire Central Valley (CDFG: 1996). Butte and Big Chico creeks are also believed to support small steelhead populations.

Flows in each of the five tributaries have been significantly altered and recent restoration plans have identified the need to provide adequate base flows dedicated for instream use (CDFG, 1993; USFWS, 1997; ERPP, 1999). Analysis of flows and diversions shows that the exercise of legal water rights (appropriative, adjudicated, and riparian) often exceeds instream flows critical for spring-run salmon and steelhead migration (CH2M Hill, 1998). Several recent water acquisition projects have been implemented including pumped groundwater exchanges on Mill and Deer creeks (CDFG 1994a, 1994b), a water exchange and water right purchase on Butte Creek (M&T Ranch, 1996), and a diversion removal on Big Chico Creek. Each of the acquisitions has provided some proportion of a minimum base flow (Alley and Assoc., 1996). Additional efforts to determine appropriate instream flows are currently in progress, and will require a long-term record of the daily hydrograph for the various reaches of each tributary.

Various flow-monitoring stations have been in place on each of the five tributaries since about 1930. These stations have been operated at various times and locations by the U. S. Geological Survey (USGS), California Department of Water Resources (CDWR), and Pacific Gas and Electric Company (PG&E), and have generally not provided a consistent enough record for analysis or management of instream flows for fish migration. In addition, needed flow monitoring for the recent instream flow acquisitions, including a need for temperature and turbidity monitoring for some tributaries and reaches, have required entirely new monitoring stations or the addition of sensors and changes in the operation of existing stations. To meet the specific additional fishery management needs, 3 additional stations were installed with 6 total sensors, 9 existing stations were modified to include 12 additional sensors, and 14 stations were modified to include real-time telemetry since 1996 through several Central Valley Project Improvement Act Anadromous Fish Restoration Program grants. Funding for long-term operation and maintenance is now required.

**b. Conceptual Model** – (1) Spring-run chinook salmon and or steelhead populations historically existed in Antelope, Mill, Deer, Big Chico, and Butte creeks prior to anthropogenic alterations to the natural hydrograph (CDFG, 1996; CDFG, 1998). (2) Base flows that are within the minimum flow range of the natural hydrograph are essential to the restoration and future survival of these spring-run chinook salmon and steelhead populations (CDFG, 1993; Alley and Assoc., 1996; USFWS, 1997; CH2M Hill, 1998). (3) Flow monitoring stations have historically been operated on each of the tributaries by water management agencies. However, the data are generally inadequate for determination or management of minimum base flows (CH2M Hill, 1998). (4) Installation and operation of flow monitoring stations specifically targeted for the management of anadromous fish migration will provide the necessary long-term time series data for determination of minimum base flows (CH2M Hill, 1998). (5) Installation and operation of flow monitoring stations specifically targeted for the management of anadromous fish migration will ensure the presence of, and facilitate the management of, dedicated instream flows acquired for anadromous fish (CDFG, 1994a, 1994b; M&T Ranch, 1996). (6) Minimum base flows dedicated for instream use will significantly contribute to the recovery of spring-run chinook salmon and steelhead in Antelope, Mill, Deer, Big Chico, and Butte creeks (CDFG, 1993; CDFG, 1996; USFWS, 1997; CDFG, 1998; ERPP, 1999).

This project specifically addresses CALFED Ecosystem Restoration Strategic Goal #1 - At Risk Species, and secondarily Goal #4 – Habitats, and CVPIA Limiting Factor #2, Instream Flows and Temperatures.

**c. Hypothesis** - Installation and long-term operation of flow monitoring stations, including sensors for temperature and turbidity, will significantly contribute to the recovery and long-term survival of spring-run chinook salmon and steelhead in Antelope, Mill, Deer, Big Chico, and Butte creeks.

**Known** - (1) Antelope, Mill, Deer, Big Chico, and Butte creeks harbor populations of state and federally listed salmon and steelhead (CDFG, 1996; CDFG, 1998). (2) Instream flows in each of the tributaries are often inadequate or non-existent during key migration periods for the listed salmon and steelhead (CH2M Hill, 1998). (3) Legal water rights in each of the tributaries at key times exceed stream flows or exceed minimum instream flow requirements for passage of anadromous fish (Alley and Assoc., 1996; CH2M Hill, 1998). (4) Instream dedicated flows for passage of anadromous fish have been acquired through various agreements in Mill, Deer, Big Chico, and Butte creeks (CDFG, 1994a, 1994b; M&T Ranch, 1996). (5) The hydrographic records for each of the tributaries is inadequate to accurately assess the total minimum instream flow necessary for anadromous fish passage (CH2M Hill, 1998). (6) Existing management and measurement of flows, as provided by the USGS or CDWR in key reaches of each tributary, are not sufficient to consistently monitor flows to ensure passage of anadromous fish (CH2M Hill, 1998). (7) Flow measurement stations have either been modified or new stations installed in key reaches of each tributary for the management of anadromous fish passage. (8) Changes in flow and turbidity as predictive cues for migration of yearling spring-run salmon in Mill, Deer, Big Chico, and Butte creeks were incorporated into the Delta Operations Sacramento River spring-run Salmon Protection Plan for the period 1997-1999, and will likely continue as a requirement of subsequent State and federal incidental take permits (CALFED, 1998).

**Results/Expected Results** - (1) Flow measurements at the newly installed or modified gaging stations on Butte Creek are being incorporated into conditions of a Bureau of Reclamation water right exchange agreement, and a permanent filing with the State Water Resources Control Board for dedication for instream use under Water Code sections 1707 and 1725 et seq. for the newly acquired 40 cubic feet per second for anadromous fish passage. (2) Flow measurements at the newly installed or modified gaging

stations on Butte Creek have been and are being incorporated into management agreements with landowners and water districts that have installed fish screens and fish ladders throughout the entire anadromous reach. (3) Flow measurements at the newly installed or modified gaging stations on Mill and Deer creeks are being used to provide real-time flow management input to the completed Mill Creek Water Exchange agreement and to the interim Deer Creek Water Exchange Agreement. (4) Flow and turbidity measurements at the newly installed or modified gages on Mill, Deer, Big Chico, and Butte creeks were used by the Delta Operations Sacramento River Spring-Run Protection Plan for the period 1997-1999, and were instrumental in the operation and management of the Delta Cross Channel gates. (5) Long-term reach specific flow, temperature, and turbidity measurements for each tributary will provide a basis for future flow acquisitions and flow management for anadromous fish. (6) Long-term reach specific flow, temperature, and turbidity measurements for each tributary will significantly contribute to the recovery and future survival of spring-run salmon and steelhead populations in Antelope, Mill, Deer, Big Chico, and Butte creeks.

**d. Adaptive Management** – (1) Evaluation of the long-term reach specific flow, temperature, and turbidity measurements for each tributary will allow for the addition, elimination, or relocation of monitoring stations or sensors to better manage flows for anadromous fish passage. (2) Long-term reach specific flow, temperature, and turbidity measurements will allow for more discrete flow management decisions.

## **2. Proposed Scope of Work**

**a. Location of Project(s)** - The proposed gaging stations on Antelope Creek, and the existing gaging stations on Mill and Deer creek are located entirely within Tehama County, and ecozone 7, Butte Basin. The gaging station on Big Chico Creek is located within Butte County, ecozone 7, Butte Basin. The gaging stations on Butte Creek are located within Butte, Colusa, and Sutter counties and ecozone 7, Butte Basin, and ecozone 8, Feather River and Sutter Bypass. (See Table 1 for a list of the stations, data type, and latitudes and longitudes, and Map 1 for the general location.)

**h. Approach** - This grant will provide for the continued partial or complete operation and maintenance of 16 stream gaging stations and associated telemetry equipment. Operation and maintenance will include the following. (1) Perform periodic station visits to inspect, maintain, calibrate, and replace station equipment as necessary, and to download all data-logger recorded sensor time series data. (2) Perform monthly discharge measurements, when stream conditions allow, to establish and maintain stage vs. discharge relationships (rating curves). (3) Process field collected data after each station visit including uploading recorded time series data to a computer database, inspection and correction of recorded data caused by sensor drift or malfunction, verification of discharge measurements and rating curve shifts, and relaying of shift data to the California Data Exchange Center (CDEC). (4) Perform annual review and updating of discharge rating curves. (5) Perform annual computation of discharge time series data and certification of all collected time series data including water stage, temperature, and turbidity. (6) Perform maintenance of long-term database for all collected time series data.

CDWR has adopted the USGS standards established for stream gaging. The USGS has published numerous technical manuals describing their field and office task quality assurance procedures (USGS, 1967 – 1981, 1982).

There are three criteria for testing the hypothesis: (1) in the short-term (3 to 5 years) do the gage records demonstrate compliance with water acquisition and management agreements, (2) in the medium

term (3 to 10 years) do the gage records provide the time series information necessary for more specific flow acquisition volumes, (3) in the long-term (5 to 50 years) does the telemetry data contribute to the long-term survival of spring-run chinook salmon and steelhead.

**c. Monitoring and Assessment Plans** - This project funds the continued operation and maintenance of previously installed flow monitoring stations or sensors that are part of an effort to assess, acquire, and manage minimum base instream flows in five eastside Sacramento River tributaries. Each of the five tributaries (Antelope, Mill, Deer, Big Chico, and Butte creeks) supports at-risk species (including spring-run salmon and steelhead) and each has significantly impaired flows that have been detrimental to the survival of the at-risk species.

Measures of success of this project are: (1) flows acquired for instream use are intact as demonstrated by the real-time telemetry, and as summarized in the long-term database, (2) telemetry time series data are being utilized for additional flow acquisitions, (3) spring-run chinook salmon and steelhead populations in each of the watersheds have recovered and long-term survival is insured.

**d. Data Handling and Storage** - All time series data from the 16 existing gaging stations are currently being telemetered on a real-time basis to the California Data Exchange Center (CDEC) website where they can be viewed or downloaded. Telemetered data available through CDEC is not reviewed or edited and is considered preliminary and subject to revision. All time series data is normally downloaded in the field from the gaging station data-loggers on a monthly basis and is then reviewed and corrected, if necessary, for sensor drift or malfunction. Reviewed and corrected data is then stored in the Department of Water Resources surface water computer database. Final publishable time series data for the entire water year (October - September) is usually available to interested parties in hard copy or electronic format three to six months after the end of the water year

**e. Expected Products/Outcomes** - Once the time series data has been finalized, CDWR will prepare an annual report presenting average daily value tables for the entire water year for all time series data including water stage, discharge, temperature, and turbidity. These annual reports will be accessible to interested parties through CDWR's website. More detailed final data (15-minute recording interval for stage, discharge, and temperature, and hourly interval for turbidity) will be available by request to CDWR.

**f. Work Schedule** - This proposal is for the continued operation and maintenance of the stream gaging stations and sensors previously installed and the two Antelope Creek stations that are expected to be installed in fiscal year 1999-2000 for a five-year period. The starting date will be October 1, 2000 and end September 30, 2005. An annual report will be prepared by March 1 of each year summarizing the stream gaging data. If the entire project cannot be funded, it is recommended to decrease the years of funding rather than delete sensors or stations.

**g. Feasibility** - The project was originally funded in 1996 and 1997 to provide for station, sensor, and telemetry installation, and operation and maintenance for three years. A fourth year of funding for operation and maintenance was provided in 1999. Subsequent water acquisition and flow management agreements (CDFG, 1994a, 1994b; M&T Ranch, 1996; CALFED, 1998) have demonstrated the feasibility and absolute need for continued funding for this project. All environmental compliance, permitting, and access issues were addressed during initial installation.

## **D. Applicability to CALFED ERP Goals and Implementation Plan and CVPIA Priorities**

**1. ERP Goals and CVPIA Priorities** - This project specifically address Ecosystem Restoration Strategic Goal #1 - At Risk Species, and secondarily Goal # 4 - Habitats. It also addresses the CVPIA priority focus on actions for recovery of Sacramento River spring-run chinook salmon and steelhead. Each of the five tributaries (Antelope, Mill, Deer, Big Chico, and Butte creeks) support either sustaining or remnant populations of the State and federally listed spring-run chinook salmon and the federally listed steelhead. Additionally, each of the tributaries support fall-run chinook salmon, and potentially late fall-run chinook salmon. Recent studies in the lower reaches of Butte and Big Chico creeks have identified rearing of juvenile chinook salmon (all races) and steelhead, not natal to either tributary (Maslin et al., 1997, 1998, 1999; CDFG, 1999). These studies have demonstrated that juvenile salmon (all races) and steelhead frequently enter and rear in the lower reaches of tributaries other than where they were spawned (non-natal rearing). A key bottleneck is the human altered flow regime, particularly in the valley reach of each of the tributaries, which affects adult migration and juvenile rearing and migration. This project provides needed long-term real-time discrete reach monitoring for management and protection of existing flow acquisitions, as well as long-term time series data for additional flow acquisitions.

**2. Relationship to Other Ecosystem Restoration Projects.** This project was originally implemented, and continues to function to provide accurate real-time monitoring of various recently implemented flow acquisitions, and for more definitive analysis of flow versus fish passage for future instream flow acquisitions. The three most recent restoration plans (Restoring Central Valley Streams: A Plan for Action, CDFG 1993; Revised Draft Restoration Plan for the Anadromous Fish Restoration Program: A Plan to Increase Natural Production of Anadromous Fish in the Central Valley of California, USFWS 1997; and Ecosystem Restoration Program Plan, CALFED 1999) have identified instream flows for anadromous fish passage as a priority action for the five tributaries included in this project. Management and protection of recent flow acquisitions on Mill Creek (CDFG, 1994b), Deer Creek (CDFG, 1994a) and Butte Creek/Big Chico Creeks (M&T Ranch, 1996) are dependent upon monitoring as provided by this project. Additionally, recent fish screen and fish ladder projects on Mill, Deer, Big Chico, and Butte creeks are dependent upon flow acquisition and flow monitoring to ensure effective operation of each structure.

**3. Requests for Next-Phase Funding.** This project was initially funded by the CVPIA AFRP (FY 96 and FY 97) to install new or modify existing monitoring stations and to operate and maintain these stations which were to be located on Antelope, Mill, Deer, Big Chico, and Butte creeks. The two grants (FY 96, \$331,000 and FY 97, \$60,000) were to install two new monitoring stations and five sensors on Antelope Creek; modify one and install one new station with a total of three new sensors on Mill Creek; modify one and install two new stations with a total of six new sensors on Deer Creek; modify one station with two new sensors on Big Chico Creek; modify six stations with a total of seven new sensors on Butte Creek; install satellite radio telemetry at 16 stations for all new and existing sensors; develop stage vs. discharge relationships for the three new stations and the existing Big Chico Creek station; and operate and maintain all new stations, sensors, and telemetry systems. As of January 1, 2000, all new stations, sensors, and telemetry systems were installed and operating except those for Antelope Creek. Station installation and operation on Antelope Creek is currently dependent upon decisions by resource managers on future anadromous fish restoration actions and needs in coordination with local landowners and stakeholders. An additional CVPIA AFRP grant (FY 2000, \$122,500) was provided for ongoing operation and maintenance of the monitoring stations through September 30, 2000 as an interim measure until long-term funding is secured.



**4. Previous Recipients of CALFED or CVPIA funding.** CVPIA AFRP funding was provided in FY 96, "Real-time flow monitoring and feed-back systems for Deer, Mill, Big Chico, and Butte creeks", Document Control Number 11332-6-0186 (\$331,000); FY 97, "Install Stream Flow Gages and Thermographs in Spring-Run Chinook Salmon Streams", an extension of the FY 96 grant (\$60,000); and FY 2000, "Maintain Real-time Flow Monitors on Antelope, Mill, Deer, Big Chico, and Butte creeks", Document Control Number 11332-O-JO11 (\$122,500). See #3 above for details.

**5. System-Wide Ecosystem Benefits.** Each of the tributaries included in this project have numerous man-made diversion structures that impact anadromous fish migration. Each of the diversions was either previously modified with adult and juvenile passage structures (fish ladders and/or fish screens), or is included in current restoration plans for installation of these passage structures. Function of each of the passage structures is dependent upon adequate base instream flows, and is equally dependent upon the ability to accurately measure and monitor flows on a real-time basis. This project provides the real-time monitoring and assurance that passage structures are functioning. Additionally, each of the tributaries included in this proposal has a variety of associated water rights (adjudicated, appropriative, riparian) which are variously monitored and enforced by the respective legal entity (local superior court or State Water Resources Control Board Division of Water Rights). Recent experience has demonstrated that local water right holders regularly monitor instream flows and the availability of their respective water rights through the use of the real-time monitoring stations provided by this project. An ancillary benefit of the public availability of telemetry information is that water right holders, as well as other interested stakeholders, can monitor flows and thus provide a less confrontational incentive for all right holders to comply with their respective rights. Another benefit of this project has been the use of real-time telemetry information (flow and turbidity) on Mill, Dear, Big Chico, and Butte creeks as a key component of the CALFED Operations Group Sacramento River Spring-run Chinook Salmon Protection Plan. That plan, which was in effect from 1997-1999, used the real-time telemetry to identify migration cues for the onset of fall/winter yearling spring-run salmon migration to guide Delta operations.

## **E. Qualifications**

The following are brief biographical sketches of the principal participants in this project and their current duties. This group has demonstrated its ability by successfully installing and maintaining the highly technical sensor, recording, and telemetry systems required during the first four years of this project.

John Clements (Proposal/Project Manager):

Senior Water Resources Engineer

Twenty-six years of state service with the California Department of Water Resources, last eight years as chief of the CDWR Northern District Watermaster and Surface Water Unit. Current duties include managing the District's Watermaster and Surface Water Measurement Programs.

Bachelor of Science Degree, CSU Chico, Civil Engineering. CA Professional Engineering License.

Lester Grade:

Water Resources Engineer, Range B

Three years of state service with the California Department of Water Resources, Northern District Watermaster and Surface Water Unit. Current duties include acting as lead person in operating 28 stream gaging stations (Red Bluff group).

Bachelor of Science Degree, Cal-Poly State University San Luis Obispo, Agricultural Engineering.

Steve Graham:

Water Resources Technician II

Sixteen years of state service with the California Department of Water Resources, last six years with the Northern District Watermaster and Surface Water Unit, Sutter Field Office. Current duties include acting as lead person in operating 23 stream gaging stations (Sutter group).

Trudy Payne:

Water Resources Technician II

Twenty-one years of state service, last four years with the California Department of Water Resources, Northern District Watermaster and Surface Water Unit, Sutter Field Office. Current duties include assisting lead person in operating 23 stream gaging stations (Sutter group).

Kevin Taylor:

Water Resources Technician I

Three years of state service with the California Department of Water Resources, Northern District Watermaster and Surface Water Unit. Current duties include serving as Watermaster for Butte Creek and assisting lead person in operating 28 stream gaging stations (Red Bluff group).

Bachelor of Science Degree, U. C. Davis, Soil and Water Science.

## **F. cost**

**1. Budget** – This proposal is requesting funding for the continued complete or partial operation of 16 of the 18 stream gaging stations used in the monitoring program for a five-year period (Federal Fiscal and Water Years 2000-01 through 2004-05). Table 1 lists the 18 stations and includes columns for Data and Telemetry Type for each station. Various agencies are funding certain station sensors and telemetry under their own stream gaging programs. These are identified in the Data and Telemetry Type columns by regular fonts. Proposed funding by CALFED/CVPWA for specific sensors and telemetry are identified by bold fonts. Proposed CALFED/CVPWA funding for the first year is \$128,700. Since the operation of the stations and sensors requires about the same labor hours, equipment, and supplies from year to year, proposed funding for the following years was estimated as the cost of the first year plus 5% inflation each year. See Table 2 for a detailed budget.

**2. Cost Sharing** – The estimated full cost for the annual operation of the 18 stream gaging stations for FY 2000 is about \$258,000. Many of the stations and sensors were operating prior to the initiation of the Real-Time Flow Monitoring Program. Estimated funding for the stations from other agencies under their own stream gaging programs is as follows:

<u>Agency</u>	<u>FY 2000 Funding (\$)</u>	<u>FY 2001-2005 Funding (\$)</u>
CDWR	\$82,000	\$476,000
USGS	\$45,000	\$262,000
PG&E	\$8,000	\$46,000
Total	\$135,000	\$784,000

Estimated funding from other agencies for Fiscal Years 2001 through 2005 also assumes 5% inflation each year. The cooperating agencies can not provide assurance of the future funding for the continued operation and maintenance of any given station or sensor at this time.

## **G. Local Involvement**

This project was initiated with, and continues to have the full support of organized watershed groups including the Mill Creek Watershed Conservancy, Deer Creek Watershed Conservancy, Butte Creek Watershed Conservancy, and the Big Chico Creek Watershed Alliance. Additionally, local water diverters including individual landowners, water districts, irrigation districts, reclamation districts, duck clubs, and water management agencies support this project. Included are the Los Molinos Mutual Water Company on Mill and Deer creeks, the Deer Creek Irrigation District and Stanford Vina Irrigation Company on Deer Creek, and the City of Chico and M&T Ranch on Big Chico Creek. Along Butte Creek, supporters include PG&E, M&T Ranch, Parrott-Investment Company, Durham Mutual Irrigation Company, Rancho Esquon Partners, Gorrill Ranch, Western Canal Water District, Reclamation District 1004, Butte Sink Waterfowl Association, White Mallard Duck Club, Reclamation District 70, Butte Slough Irrigation Company, and the U.S. Fish and Wildlife Service Sacramento Refuge Complex.

Public outreach has been and continues to be primarily the public availability of the real-time telemetry information.

## **H. Compliance with Standard Terms and Conditions**

The California Department of Water Resources will comply with all state and federal standard terms. According to Table D-1 of the CALFED 2001 Proposal Solicitation Package, no state proposal or contract forms from the California Department of Water Resources are required at this time. Federal Form 424 is attached to the back of this proposal.

## **I. Literature Cited**

Alley, D. W., and Associates. 1996. IFIM Modeling of Critical Passage Riffles, with Recommended Passage Flows for Chinook Salmon in Lower Mill Creek, Tehama County, California, 1995.

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California Department of Fish and Game (CDFG). 1994b. Delta Pumping Plant Fish Protection Agreement - Mill Creek Water Exchange Project, Phase II.

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California Department of Fish and Game (CDFG). 1999. Butte Creek Spring-Run Chinook Salmon (*Oncorhynchus tshawytscha*) Juvenile Outmigration and Life History 1995-1998. Inland Fisheries Admin. Report 99-5.

CH2M Hill. 1998. Hydrologic and Water Rights Analyses for Selected Sacramento Valley Spring Run Salmon Streams.

ERPP. 1999. CALFED Bay-Delta Program, Ecosystem Restoration Program Plan, Vol. 2, Ecological Management Zone Visions, Butte Basin Ecological Management Zone and Feather River/Sutter Basin Ecological Management Zone.

Hallock, R., and W. Van Woert. 1959. A Survey of Anadromous Fish Losses in Irrigation Diversions From the Sacramento and San Joaquin Rivers. Calif. Fish and Game, V. 45-4.

Maslin, P., M. Lennox, J. Kindopp, and W. McKinney. 1997. Intermittent Streams as Rearing Habitat for Sacramento River Chinook Salmon (*Oncorhynchus tshawytscha*).

Maslin, P., M. Lennox, and J. Kindopp. 1998. Intermittent Streams as Rearing Habitat for Sacramento River Chinook Salmon (*Oncorhynchus tshawytscha*), 1998 update.

Maslin, P., M. Lennox, J. Kindopp, and C. Storm. 1999. Intermittent Streams as Rearing Habitat for Sacramento River Chinook Salmon (*Oncorhynchus tshawytscha*), 1999 update.

M&T Ranch. 1996. Agreement for Relocation of M&T/Parrott Pumping Plant Providing for Bypass of Flows in Butte Creek.

U. S. Fish and Wildlife Service (USFWS). 1997. Revised Draft Restoration Plan for the Anadromous Fish Restoration Program. A Plan to Increase Natural Production of Anadromous Fish in the Central Valley of California.

U. S. Geological Survey (USGS). 1967 – 81. Techniques of Water Resource Investigations of the U. S. Geological Survey. TWRI Reports I-D1 through 8-B2.

U. S. Geological Survey (USGS). 1982. Measurement and Computation of Streamflow: Volume 1, Measurement of Stage and Discharge; and Volume 2, Computation of Discharge. Geological Survey Water-Supply Paper 2175.

## **J. Threshold Requirements**

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The Letters of Notification, Environmental Compliance Checklist, and Land Use Checklist are attached to the back of this proposal. According to Table D-1 of the CALFED 2001 Proposal Solicitation Package, no state proposal or contract forms from the California Department of Water Resources are required at this time. Federal Form 424 is attached to the back of this proposal.

## **Appendix**

### **Next Phase Funding**

### **Real-Time Flow Monitoring**

**Project Description** - This project funds the continued operation and maintenance of previously installed flow monitoring stations that are part of an effort to assess, acquire, and manage minimum base instream flows in five eastside Sacramento River tributaries. Each of the five tributaries (Antelope, Mill, Deer, Big Chico, and Butte creeks) supports at-risk species, including spring-run salmon and steelhead, and each has significantly impaired flows that have been detrimental to the survival of the at-risk species.

#### **Scientific Merit**

**Hypothesis** - Installation and long-term operation of flow monitoring stations, including sensors for temperature and turbidity, will significantly contribute to the recovery and long-term survival of spring-run chinook salmon and steelhead in Antelope, Mill, Deer, Big Chico, and Butte creeks.

**Known** – (1) Antelope, Mill, Deer, Big Chico, and Butte creeks harbor populations of state and federally listed salmon and steelhead (CDFG 1996; CDFG, 1998). (2) Instream flows in each of the tributaries are often inadequate or non-existent during key migration periods for the listed salmon and steelhead (CH2M Hill, 1998). (3) Legal water rights in each of the tributaries at key times exceed stream flows or exceed minimum instream flow requirements for passage of anadromous fish (Alley and Assoc., 1996; CH2M Hill, 1998). (4) Instream dedicated flows for passage of anadromous fish have been acquired through various agreements in Mill, Deer, Big Chico, and Butte creeks (CDFG, 1994a, 1994b; M&T Ranch, 1996). (5) The hydrographic records for each of the tributaries is inadequate to accurately assess the total minimum instream flow necessary for anadromous fish passage (CH2M Hill, 1998). (6) Existing management and measurement of flows, as provided by the USGS or CDWR in key reaches of each tributary, are not sufficient to consistently monitor flows to ensure passage of anadromous fish (CH2M Hill, 1998). (7) Flow measurement stations have either been modified or new stations installed in key reaches of each tributary for the management of anadromous fish passage. (8) Changes in flow and turbidity as predictive cues for migration of yearling spring-run salmon in Mill, Deer, Big Chico, and Butte creeks were incorporated into the Delta Operations Sacramento River spring-run Salmon Protection Plan for the period 1997-1999, and will likely continue as a requirement of subsequent State and federal incidental take permits (CALFED, 1998).

**Adaptive Management** – (1) Evaluation of the long-term reach specific flow, temperature, and turbidity measurements for each tributary will allow for the addition, elimination or relocation of monitoring stations or sensors to better manage flows for anadromous fish passage. (2) Long-term reach specific flow, temperature and turbidity measurements will allow for more discrete flow management decisions.

**Current Status** - This project was initially funded by the CVPIA AFRP (FY 96 and FY 97) to install new or modify existing monitoring stations and to operate and maintain these stations which were to be located on Antelope, Mill, Deer, Big Chico, and Butte creeks. The two grants (FY 96, \$331,000 and FY 97, \$60,000) were to install two new monitoring stations and five sensors on Antelope Creek; modify one and install one new station with a total of three new sensors on Mill Creek; modify one and install two new stations with a total of six new sensors on Deer Creek; modify one station with two new sensors on Big Chico Creek modify six stations with a total of seven new sensors on Butte Creek; install satellite radio telemetry at 16 stations for all new and existing sensors; develop stage vs. discharge relationships for the

three new stations and the existing Big Chico Creek station; and operate and maintain all new stations, sensors, and telemetry systems. As of January 1, 2000, all new stations, sensors, and telemetry systems were installed and operating except those for Antelope Creek. Station installation and operation on Antelope Creek is currently dependent upon decisions by resource managers on future anadromous fish restoration actions and needs in coordination with local landowners and stakeholders. An additional CVPIA AFRP grant (FY 2000, \$122,500) was provided for ongoing operation and maintenance of the monitoring stations through September 30, 2000 as an interim measure until long-term funding is secured.

**Existing Data Collection and Monitoring** - All time series data from the 16 gaging stations **are** currently being telemetered on a real-time basis to the California Data Exchange Center (CDEC) website where they can be viewed or downloaded. Telemetered data available through CDEC is not reviewed or edited and is considered preliminary and subject to revision. All time series data is normally downloaded in the field from the gaging station data-loggers on a monthly basis and is then reviewed and corrected, if necessary, for sensor drift or malfunction. Reviewed and corrected data is then stored in the Department of Water Resources surface water computer database. Final publishable time series data for the entire water year (October – September) is usually available to interested parties in hard copy or electronic format by request to CDWR three to six months after the end of the water year.

TABLE 1

## REAL-TIME FLOW MONITORING

## STATION LIST AND DATA TYPE

No.	Stream	Name / Site	Operating Agency	ID Number	1/ Data Type	2/ Telemetry Type	County	Latitude	3/ Longitude
1	Antelope Creek	Above all diversions 4/	DWR	---	S - D - TP - TB	CDEC	Tehama	---	---
2	Antelope Creek	Below all diversions 4/	DWR	---	S - D - TP	CDEC	Tehama	---	---
3	Mill Creek	Near Los Molinos	USGS	11381500	S - D - TP	CDEC	Tehama	40-03-17	122-01-23
4	Mill Creek	Below Highway 99	DWR	A04420	S - D - TP	CDEC	Tehama	40-02-26	122-06-12
5	Deer Creek	At Highway 32	DWR	A43180	S - D - TP	CDEC	Tehama	40-15-53	121-27-00
6	Deer Creek	Near Vina	USGS	11383500	S - D - TP - TB	CDEC	Tehama	40-00-51	121-56-50
7	Deer Creek	Below Vina Dam	DWR	A04325	S - D - TP	CDEC	Tehama	39-57-48	122-02-01
8	Big Chico Creek	Near Chico	DWR	A42105	S - D - TP - TB	CDEC	Butte	39-46-06	121-46-38
9	Butte Creek	Toadtown Canal 5/	PG&E	BW-12	S - D - TP	CDEC	Butte	39-53-09	121-38-35
10	Butte Creek	Near Chico	USGS	11390000	S - D - TP - TB	CDEC	Butte	39-43-34	121-42-28
11	Butte Creek	Parrott Diversion 6/	DWR	A41105	S - D	CDEC	Butte	39-42-35	121-45-01
12	Butte Creek	Near Durham	DWR	A04265	S - D - TP	CDEC	Butte	39-40-41	121-46-35
13	Butte Creek	Below Western Canal	DWR	A04158	S - D - TP	CDEC	Butte	39-33-26	121-50-03
14	Butte Creek	At Colusa/Grindley Road	DWR	A04140	S - D - TP	CDEC	Butte	39-21-43	121-53-30
15	Butte Slough	At Outfall Gates 7/	DWR	A02967	S - D - TP	CDEC	Colusa	39-11-44	121-56-04
16	Butte Slough	Near Meridian	DWR	A02972	S - D	CDEC	Sutter	39-10-41	121-54-24
17	Willow Slough	At S.B. West Borrow Pit	DWR	A02943	S - D	CDEC	Sutter	38-54-53	121-37-36
18	Sacramento Slough	Near Karnak 8/	DWR	A02925	S - D	CDEC	Sutter	38-46-45	121-38-15

**Notes:**

1/ Data Type: S = Stage, D = Discharge, TP = Temperature, TB = Turbidity.

2/ California Data Exchange Center via GOES satellite radios.

3/ Source of latitude and longitude: MAPTECH software.

4/ The Antelope Creek stations have not been installed due to lack of right of entry. Recording, sensor, and telemetry equipment was purchased under AFRP Grant FY97.

5/ Station is located on PG&amp;E import canal from the West Branch Feather River. This station is reviewed and published by the USGS as Toadtown Canal near Sterling. USGS ID Number is 11389800.

6/ Station is located on M&amp;T / Parrott diversion from Butte Creek.

7/ Station records discharge from Butte Creek to Sacramento River via Butte Slough Outfall Gates. Requires two stage recording devices, gate openings, and special computations to determine discharge.

8/ Requires two stage recording devices and special computations to determine discharge.



TABLE 2

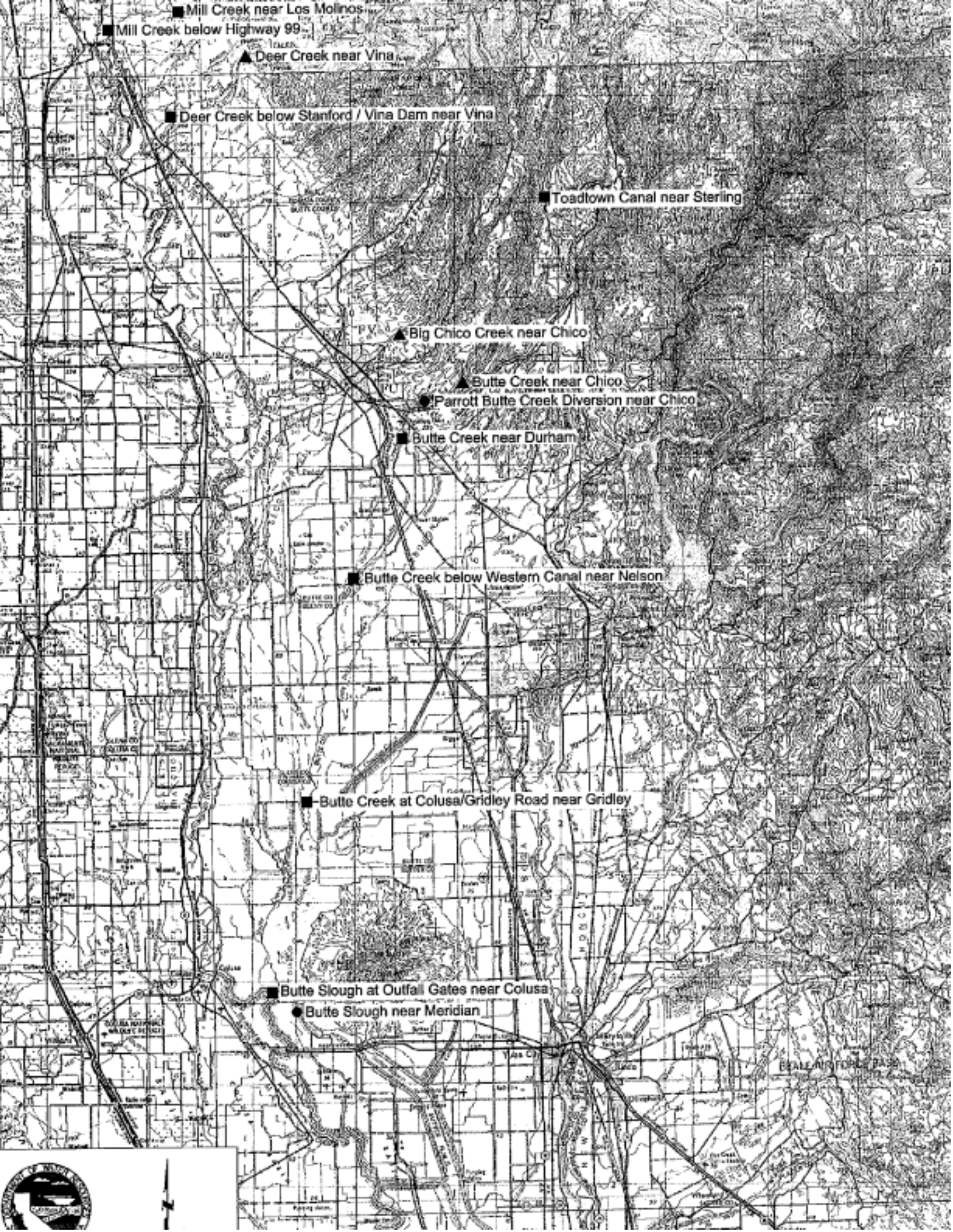
## REAL - TIME FLOW MONITORING

## ANNUAL AND TOTAL BUDGET

Federal Fiscal Year	Task 1/ 1	Direct Labor		Labor Benefits 3/ 2	Overhead (56%) 4/ 3	Service Contract 5/ 4	Equipment 6/ 5	Supplies 7/ 6	Total
		Hours	Salaries 2/ 1						
2000-01	1	200	\$ 5,000	\$ 2,500	\$ 4,200	---	\$ 20,000	\$ 1,500	\$ 33,200
	2	350	\$ 8,800	\$ 4,400	\$ 7,400	---	\$ 4,000	\$ 1,000	\$ 25,600
	3	250	\$ 6,300	\$ 3,200	\$ 5,300	---	\$ 3,000	\$ 500	\$ 18,300
	4	100	\$ 2,500	\$ 1,300	\$ 2,100	---	\$ 1,000	\$ 200	\$ 7,100
	5	100	\$ 2,500	\$ 1,300	\$ 2,100	---	\$ -	\$ 100	\$ 6,000
	6	50	\$ 1,300	\$ 700	\$ 1,100	---	\$ 1,000	\$ 100	\$ 4,200
	Project Management 8/ 7	100	\$ 3,500	\$ 1,800	\$ 3,000	---	---	---	\$ 8,300
	Total Cost Year 1	1,150	\$ 29,900	\$ 15,200	\$ 25,200	\$ 26,000	\$ 29,000	\$ 3,400	\$ 128,700
2001-02	Total Cost Year 2				(assume 5% inflation from previous year)				\$ 135,100
2002-03	Total Cost Year 3				(assume 5% inflation from previous year)				\$ 141,900
2003-04	Total Cost Year 4				(assume 5% inflation from previous year)				\$ 149,000
2004-05	Total Cost Year 5				(assume 5% inflation from previous year)				\$ 156,500
Total Project Cost									\$ 711,200

## Notes:

- 1/ See section 2b. Scope of Work Approach for description of itemized tasks 1 through 6.  
 2/ Water Resources Technician II at \$25 per hour. Project Management (Senior Engineer) at \$35 per hour.  
 3/ Benefits at 50% of salaries.  
 4/ Overhead at 56% of sum of salaries and benefits. Normal DWR Northern District overhead at about 65%.  
 5/ Lump sum payable to USGS for annual cost of temperature data for three stations (\$6,000) and turbidity data for two stations (\$20,000).  
 6/ Equipment includes replacement items over \$1,000 per unit such as lap-top computers, data-loggers, satellite radios, and stage, temperature, and turbidity sensors.  
 7/ Supplies includes expendable items such as staff gages, batteries, solar panels, current meter parts, and general office supplies.  
 8/ Project management includes Unit Chief (Senior Engineer at \$35 per hour) tracking of expenditures, review of final annual data and report, and data collection and analysis procedures.



■ Mill Creek near Los Molinos

■ Mill Creek below Highway 99

▲ Deer Creek near Vina

■ Deer Creek below Stanford / Vina Dam near Vina

■ Toadtown Canal near Sterling

▲ Big Chico Creek near Chico

▲ Butte Creek near Chico

● Parrott Butte Creek Diversion near Chico

■ Butte Creek near Durham

■ Butte Creek below Western Canal near Nelson

■ Butte Creek at Colusa/Griddle Road near Gridley

■ Butte Slough at Outfall Gates near Colusa

● Butte Slough near Mendian



# APPLICATION FOR FEDERAL ASSISTANCE

OMB Approval No. 0348-0043

TYPE OF SUBMISSION: <input type="checkbox"/> Application <input type="checkbox"/> Construction <input checked="" type="checkbox"/> Non-Construction <input type="checkbox"/> Preapplication <input type="checkbox"/> Construction <input checked="" type="checkbox"/> Non-Construction		2. DATE SUBMITTED <b>May 31, 2000</b>	Applicant identifier
		3. DATE RECEIVED BY STATE	State Application identifier
		4. DATE RECEIVED BY FEDERAL AGENCY	Federal Identifier

5. APPLICANT INFORMATION	
Legal Name: <b>California Department of Water Resources</b>	Organizational Unit: <b>DPLA, Northern District</b>
Address (give city, county, State, and zip code): <b>2440 Main Street Tehama County Red Bluff, California 96080</b>	Name and telephone number of person to be contacted on matters involving this application (give area code) <b>John Clements (530) 529-7369</b>

6. EMPLOYER IDENTIFICATION NUMBER (EIN): <b>52-1692634</b>	7. TYPE OF APPLICANT: (enter appropriate letter in box) <input type="checkbox"/> A. State B. County C. Municipal D. Township E. Interstate F. Intermunicipal G. Special District H. Independent School Dist. I. State Controlled Institution of Higher Learning J. Private University K. Indian Tribe L. Individual M. Profit Organization N. Other (Specify) _____
---	---

8. TYPE OF APPLICATION <input type="checkbox"/> New <input checked="" type="checkbox"/> Continuation <input type="checkbox"/> Revision If Revision, enter appropriate letter(s) in box(es) <input type="checkbox"/> <input type="checkbox"/> A. Increase Award B. Decrease Award C. Increase Duration D. Decrease Duration Other (specify): _____	9. NAME OF FEDERAL AGENCY: <b>U.S. Bureau of Reclamation</b>
---	---

10. CATALOG OF FEDERAL DOMESTIC ASSISTANCE NUMBER: <b>XX-XXXX</b> <b>Central Valley Project Improvement Act</b>	11. DESCRIPTIVE TITLE OF APPLICANT'S PROJECT: <b>"Real-Time Flow Monitoring"</b>
---	---

12. AREAS AFFECTED BY PROJECT (Cities, Counties, States, etc.): <b>City of Chico, Butte, Colusa, Sutter and Tehama counties.</b>	13. PROPOSED PROJECT	14. CONGRESSIONAL DISTRICTS OF
---	----------------------	--------------------------------

Start Date <b>10/1/2000</b>	Ending Date <b>9/30/2000</b>	a. Applicant <b>California Department of Water Resources</b>	b. Project <b>"Real-Time Flow Monitoring"</b>
--------------------------------	---------------------------------	---	--

15. ESTIMATED FUNDING		16. IS APPLICATION SUBJECT TO REVIEW BY STATE EXECUTIVE ORDER 12372 PROCESS?	
a. Federal	<b>711,200</b>	a. YES. THIS PREAPPLICATION/APPLICATION WAS MADE AVAILABLE TO THE STATE EXECUTIVE ORDER 12372 PROCESS FOR REVIEW ON: DATE _____	
b. Applicant		b. No. <input type="checkbox"/> PROGRAM IS NOT COVERED BY E.O. 12372 <input type="checkbox"/> OR PROGRAM HAS NOT BEEN SELECTED BY STATE FOR REVIEW	
c. State	00		
d. Local	\$ 00		
e. Other	\$ 00		
f. Program Income	\$ 00		
g. TOTAL	\$ <b>711,200</b>	17. IS THE APPLICANT DELINQUENT ON ANY FEDERAL DEBT? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If "Yes," attach an explanation.	

18. TO THE BEST OF MY KNOWLEDGE AND BELIEF, ALL DATA IN THIS APPLICATION/PREAPPLICATION ARE TRUE AND CORRECT, THE DOCUMENT HAS BEEN DULY AUTHORIZED BY THE GOVERNING BODY OF THE APPLICANT AND THE APPLICANT WILL COMPLY WITH THE ATTACHED ASSURANCES IF THE ASSISTANCE IS AWARDED.		
a. Type Name of Authorized Representative <b>Dwight P. Russell</b>	b. Title <b>District Chief</b>	c. Telephone Number <b>(530) 529-7342</b>
Signature of Authorized Representative <b>DWIGHT P. Russell</b>		d. Date Signed <b>5/31/2000</b>

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Standard Form 424 (Rev. 7-97)

Prescribed by OMB Circular A-102

## INSTRUCTIONS FOR THE SF-424

Public reporting burden for this collection of information is estimated to average 45 minutes per response, including time for reviewing instructions, searching existing data-sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0043), Washington, DC 20503.

**PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.**

This is a standard form used by applicants as a required facesheet for preapplications and applications submitted for Federal assistance. It will be used by Federal agencies to obtain applicant certification that States which have established a review and comment procedure in response to Executive Order 12372 and have selected the program to be included in their process, have been given an opportunity to review the applicant's submission.

- | Item: | Entry:  | Item: | Entry:   |
|-------|---|-------|--|
| 1.    | Self-explanatory.   | 12.   | List only the largest political entities affected (e.g., State, counties, cities).   |
| 2.    | Date application submitted to Federal agency (or State if applicable) and applicant's control number (if applicable).   | 13.   | Self-explanatory..   |
| 3.    | State use only (if applicable).   | 14.   | List the applicant's Congressional District and any District(s) affected by the program or project.  |
| 4.    | If this application is to continue or revise an existing award, enter present Federal identifier number. If for a new project, leave blank.   | 15.   | Amount requested or to be contributed during the first funding/budget period by each contributor. Value of in-kind contributions should be included on appropriate lines as applicable. If the action will result in a dollar change to an existing award, indicate <i>only</i> the amount of the change. For decreases, enclose the amounts in parentheses. If both basic and supplemental amounts are included, show breakdown on an attached sheet. For multiple program funding, use totals and show breakdown using same categories as item 15. |
| 5.    | Legal name of applicant, name of primary organizational unit which will undertake the assistance activity, complete address of the applicant, and name and telephone number of the person to contact on matters related to this application.  | 16.   | Applicants should contact the State Single Point of Contact (SPOC) for Federal Executive Order 12372 to determine whether the application is subject to the State intergovernmental review process.  |
| 6.    | Enter Employer Identification Number (EIN) as assigned by the Internal Revenue Service.   | 17.   | This question applies to the applicant organization, not the person who signs as the authorized representative. Categories of debt include delinquent audit disallowances, loans and taxes.  |
| 7.    | Enter the appropriate letter in the space provided.   | 18.   | To be signed by the authorized representative of the applicant. A copy of the governing body's authorization for you to sign this application as official representative must be on file in the applicant's office. (Certain Federal agencies may require that this authorization be submitted as part of the application.)  |
| a.    | Check appropriate box and enter appropriate letter(s) in the space(s) provided:<br><br>-- "New" means a new assistance award.<br><br>-- "Continuation" means an extension for an additional funding/budget period for a project with a projected completion date.<br><br>-- "Revision" means any change in the Federal Government's financial obligation or contingent liability from an existing obligation. |       |  |
| 9.    | Name of Federal agency from which assistance is being requested with this application.  |       |  |
| 10.   | Use the Catalog of Federal Domestic Assistance number and title of the program under which assistance is requested.   |       |  |
| 11.   | Enter a brief descriptive title of the project. If more than one program is involved, you should append an explanation on a separate sheet. If appropriate (e.g., construction or real property projects), attach a map showing project location. For preapplications, use a separate sheet to provide a summary description of this project.   |       |  |

# BUDGET INFORMATION - Non-Construction Programs

OMB Approval No. 0348-0044

## SECTION A - BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. Field Tasks		\$ 58,800	\$	\$	\$	\$
2. Office Tasks		35,600				
3. Service Contract		26,000				
4. Project Management		8,300				
5. Totals		\$ 128,700	\$	\$	\$	\$

## SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY				Total (5)
	(1)	(2)	(3)	(4)	
a. Personnel	\$ 13,800	\$ 12,600	\$	\$ 3,500	\$ 29,900
b. Fringe Benefits	6,900	6,500		1,800	8,990
c. Travel					0
d. Equipment	24,000	5,000			29,000
e. Supplies	2,500	900			3,400
f. Contractual			26,000		26,000
g. Construction					
h. Other					
i. Total Direct Charges (sum of 6a-6h)					
j. Indirect Charges	11,600	10,600		3,000	25,200
k. TOTALS (sum of 6i and 6j)	\$ 58,800	\$ 35,600	\$ 26,000	\$ 8,300	\$ 128,700
7. Program Income	\$	\$	\$	\$	\$

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Prescribed by OMB Circular A-102



SECTION C - NON-FEDERAL RESOURCES				
(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e) TOTALS
8.	\$	\$	\$	\$
9.				
10.				
11.				
12. TOTAL [sum of lines 8-11]	\$	\$	\$	\$

SECTION D - FORECASTED CASH NEEDS					
	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	\$ 128,700	\$ 32,175	\$ 32,175	\$ 32,175	\$ 32,175
14. Non-Federal					
15. TOTAL (sum of lines 13 and 14)	\$ 128,700	\$ 32,175	\$ 32,175	\$ 32,175	\$ 32,175

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT					
(a) Grant Program	FUTURE FUNDING PERIODS (Years)				
	(b) First	(c) Second	(d) Third	(e) Fourth	FIFTH
16. Real-Time Flow Monitoring	\$128,700	\$ 135,100	\$ 141,900	\$ 149,000	\$156,500
17.					
18.					
19.					
20. TOTAL [sum of lines 16-19]	\$128,700	\$ 135,100	\$ 141,900	\$ 149,000	\$156,500

SECTION F - OTHER BUDGET INFORMATION	
21. Direct Charges:	22. Indirect Charges:
23. Remarks:	

**DEPARTMENT OF WATER RESOURCES**

NORTHERN DISTRICT

2440 MAIN STREET

RED BLUFF, CA 96080-2398



May 15, 2000

Mr. John Blacklock  
Clerk for the Board of Supervisors  
County of Butte  
25 County Center Drive  
Oroville, California 95965

Dear Mr. Blacklock:

The California Department of Water Resources is submitting a proposal for funding to CALFED to provide real-time flow monitoring for spring-run chinook salmon on five east-side tributaries to the Sacramento River including Antelope, Mill, Deer, Big Chico, and Butte creeks.

From 1996 through 1999, DWR received funding through the Central Valley Project Improvement Act Anadromous Fisheries Restoration Plan to install or enhance 18 stream gaging station monitoring sites. The purpose of these gages is to develop baseline information for acquisition and to provide the ability to monitor acquired flows, as well as, provide spring-run migrational cue information. The AFRP has recently been incorporated with CALFED. The CALFED proposal would provide funding for the continued operation and maintenance of the 18 gaging stations for federal fiscal years (October through September) 2000-2001 through 2004-2005. Final approval of CALFED proposals will not occur until October 2000.

Enclosed is a copy of DWR's proposal. CALFED requires notification to local governments of all CALFED proposals.

If you have any questions or require additional information about the proposal, please contact John Clements at (530) 529-7369.

Sincerely,

A handwritten signature in dark ink, appearing to read "Dwight P. Russell".

Dwight P. Russell, Chief  
Northern District

Enclosures

**DEPARTMENT OF WATER RESOURCES**

NORTHERN DISTRICT  
2440 MAIN STREET  
RED BLUFF, CA 96080-2398



May 15, 2000

Butte County Planning Commission  
7 County Center Drive  
Oroville, California 95965

The California Department of Water Resources is submitting a proposal for funding to CALFED to provide real-time flow monitoring for spring-run chinook salmon on five east-side tributaries to the Sacramento River including Antelope, Mill, Deer, Big Chico, and Butte creeks.

From 1996 through 1999, DWR received funding through the Central Valley Project Improvement Act Anadromous Fisheries Restoration Plan to install or enhance 18 stream gaging station monitoring sites. The purpose of these gages is to develop baseline information for acquisition and to provide the ability to monitor acquired flows, as well as, provide spring-run migrational cue information. The AFRP has recently been incorporated with CALFED. The CALFED proposal would provide funding for the continued operation and maintenance of the 18 gaging stations for federal fiscal years (October through September) 2000-2001 through 2004-2005. Final approval of CALFED proposals will not occur until October 2000.

Enclosed is a copy of DWR's proposal. CALFED requires notification to local governments of all CALFED proposals.

If you have any questions or require additional information about the proposal, please contact John Clements at (530) 529-7369..

Sincerely,

Dwight P. Russell, Chief  
Northern District

Enclosures



## DEPARTMENT OF WATER RESOURCES

NORTHERN DISTRICT  
2440 MAIN STREET  
RED BLUFF, CA 96080-2398



May 15, 2000

City of Chico  
Community Development Department  
Planning Office  
Post Office Box 3420  
Chico, California 95927

The California Department of Water Resources is submitting a proposal for funding to CALFED to provide real-time flow monitoring for spring-run chinook salmon on five east-side tributaries to the Sacramento River including Antelope, Mill, Deer, Big Chico, and Butte creeks.

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Dwight P. Russell, Chief  
Northern District

Enclosures

**DEPARTMENT OF WATER RESOURCES**

NORTHERN DISTRICT  
2440 MAIN STREET  
RED BLUFF, CA 96080-2398



May 15, 2000

Ms. Barbara Evans  
City Clerk  
City of Chico  
Post Office Box 3420  
Chico, California 95927

Dear Ms. Evans:

The California Department of Water Resources is submitting a proposal for funding to CALFED to provide real-time flow monitoring for spring-run chinook salmon on five east-side tributaries to the Sacramento River including Antelope, Mill, Deer, Big Chico, and Butte creeks.

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Northern District

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**DEPARTMENT OF WATER RESOURCES**

NORTHERN DISTRICT  
2440 MAIN STREET  
REO BLUFF, CA 96080-2398



May 15, 2000

Ms. Nancy Newlin  
Clerk for the Board of Supervisors  
County of Colusa  
456 Jay Street  
Colusa, California 95932

Dear Ms. Newlin:

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Northern District

Enclosures

**DEPARTMENT OF WATER RESOURCES**

NORTHERN DISTRICT  
2440 MAIN STREET  
RED BLUFF, CA 96080-2398



May 15, 2000

Colusa County Planning Department  
220 12<sup>th</sup> Street  
Colusa, California 95932

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Northern District

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**DEPARTMENT OF WATER RESOURCES**

NORTHERN DISTRICT  
2440 MAIN STREET  
RED BLUFF, CA 96080-2398



May 15, 2000

Ms. Vickie Latourelle  
Deputy Clerk for the Board of Supervisors  
County of Tehama  
Post Office Box 250  
Red Bluff, California 96080

Dear Ms. Latourelle:

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Dwight P. Russell, Chief  
Northern District

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**DEPARTMENT OF WATER RESOURCES**

NORTHERN DISTRICT  
2440 MAIN STREET  
RED BLUFF, CA 96080-2398



May 15, 2000

Tehama County Planning Department  
444 Oak Street, Room I  
Court House Annex  
Red Bluff, California 96080

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## DEPARTMENT OF WATER RESOURCES

NORTHERN DISTRICT  
2440 MAIN STREET  
RED BLUFF, CA 96080-2398



May 15, 2000

Ms. Lonna B. Smith  
Clerk for the Board of Supervisors  
County of Sutter  
463 Second Street  
Yuba City, California 95991

Dear Ms. Smith:

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Northern District

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**DEPARTMENT OF WATER RESOURCES**

NORTHERN DISTRICT  
2440 MAIN STREET  
RED BLUFF, CA 96080-2398



May 15, 2000

Sutter County Planning Department  
1160 Civic Center Drive  
Yuba City, California 95993

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